

# PATENT COOPERATION TREATY



From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2004/012771

International filing date (day/month/year)  
27.08.2004

Priority date (day/month/year)  
29.08.2003

International Patent Classification (IPC) or both national classification and IPC  
C09K11/06, C08F212/32

Applicant  
SHOWA DENKO K.K.

#### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

#### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

#### 3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/JP2004/012771

PCT/JP2004/012771 2005

**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/012771

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**Box No. II Priority**

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1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

4. Additional observations, if necessary:

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**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

**see separate sheet**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

JAP2004/012771 International application No. 2006

PCT/JP2004/012771

Reference is made to the following documents:

- D1: WO 03/018653 A (JAPAN BROADCASTING CORP ; SHOWA DENKO KK (JP))  
6 March 2003 (2003-03-06)
- D2: EP-A-1 298 736 (SEMICONDUCTOR ENERGY LAB) 2 April 2003 (2003-04-02)
- D3: DOMERCQ B ET AL: "Photo-crosslinkable polymers as hole transport materials for organic light-emitting diodes" PROCEEDINGS OF THE SPIE, SPIE, BELLINGHAM, VA, US, vol. 4642, 2000, pages 88-96, XP002297916 ISSN: 0277-786X

It is remarked that D1 is the priority of EP1424350, therefore the same technical information present in D1 can be read in EP1424350.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

2.1) The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-11 does not involve an inventive step in the sense of Article 33(3) PCT.

2.2) The document D1 discloses polymers comprising (see claim 1) a phosphorescent unit being a metall complex monomer (see page 15 of D1) and an hole transporting unit as described in claims 1 and 2 of the present application with  $p=1$  but wherein the linking group X is not specified (see in particular page 13).

2.3) The hole transporting units are often described in D1 as being linked by a single bond (see for example page 15,17,33). A man skilled in the art would therefore consider this kind of link as the first possibility when linking an unit as described on page 15 of D1 to a vinyl moiety. Furthermore it is remarked that in the absence of any technical effect due to the selection of the linking group (X in formula 1), a man skilled in the art of electroluminescent polymer materials would select any alternative linking group between the vinyl functionality and the hole transport functionality without involving an inventive

step.

2.4) The presence of an electron transporting unit is suggested in the prior art (see in particular page 42 of D1 and claim 10 of corresponding EP1424250). Organic light emitting elements comprising the polymer are also disclosed (see abstract of D1).

Therefore the subject matter of claims 1-7 is regarded as not being inventive over D1.

2.5) Document D2 provides (see D2 paragraphs 29, 41-43) an example of common practice in the field of oLEDs. The anode is often treated by an UV ozone treatment or plasma treatment.

Therefore the subject matter of claims 18-11 is regarded as not being inventive.

2.6) Polymerizable compounds comprising a unit as described in claim 1 with  $p=0$  are known from D3 (see abstract and claim 5), however the units described therein comprise at least two unsaturated links and therefore they form a crosslinked structure.